I/We Claim:

1. A method for enhancing speech intelligibility of a speech signal, comprising the steps of:

(a) performing syllable segmentation on a frame of the speech signal in order to detect a syllable;

(b) dynamically determining a scaling factor for a segment of speech in response to step (a), wherein the segment is contained in the frame;

(c) applying the scaling factor to the segment in order to modify a time scaling to the segment; and

(d) blending the segment with an overlapping segment in order to essentially retain a frequency attribute of the speech signal that is processed.

2. The method of claim 1, wherein the syllable is a time-scale modification syllable (TSMS) comprising a consonant –vowel transition and a steady-state vowel.

3. The method of claim 2, wherein step (b) comprises the steps of:

setting the scaling factor to a first value, wherein time expansion occurs during an approximate first one third of the TSMS; and

setting the scaling factor to a second value, wherein time compression occurs during an approximate next two thirds of the TSMS.

4. The method of claim 2, wherein step (b) comprises the steps of:

setting the scaling factor to a first value, wherein time expansion occurs during the consonant-vowel transition; and

setting the scaling factor to a second value, wherein time compression occurs during a steady-state vowel.

5. The method of claim 4, where step (b) further comprises:

setting the scaling factor to a third value, wherein time compression occurs during low energy regions of the speech signal.

6. The method of claim 5, wherein a time duration of the speech signal is essentially equal to a time duration of the processed speech signal.

7. The method of claim 1, further comprising the step of:

(e) modifying frequency domain characteristics of the speech signal in order that a transformed speech signal is characterized by enhanced acoustic cues.

8. The method of claim 7, wherein step (e) comprises:

adaptive spectral enhancing the speech signal, wherein a distinctness of spectral peaks of the speech signal is increased.

9. The method of claim 8, wherein step (e) further comprises:

emphasizing higher frequencies of the speech signal, wherein an upward spread of masking of the speech signal is reduced.

10. The method of claim 1, wherein step (d) utilizes an algorithmic technique selected from the group consisting of an overlap-add (OLA) technique and a waveform similarity overlap-add (WSOLA) technique.

11. The method of claim 1, wherein step (d) comprises the steps of:

adding the overlapping segment with the segment if a correlation between the two segments is greater than a threshold; and

essentially retaining the segment if the correlation between the two segments is less than the threshold.

12. The method of claim 2, wherein step (a) comprises:

detecting a high energy region of the speech signal.

13. The method of claim 2, wherein step (a) comprises:

detecting abrupt changes in frequency-domain characteristics of the speech signal.

14. The method of claim 2, wherein step (a) comprises:

utilizing cross-correlation measures.

15. The method of claim 2, further comprising the step of:

amplifying a first portion of the TSMS in order to partially restore an associated energy in response to step (c).

16. The method of claim 1, further comprising the steps of:

(e) determining a time delay associated with the segment; and

(f) adjusting the scaling factor of a subsequent segment if the time delay is greater than a threshold in response to step (c).

17. The method of claim 1, wherein the frequency attribute is a short-term Fourier Transform (STFT) of the speech signal.

18. The method of claim 1, further comprising the step of:

(e) outputting a processed speech signal to a telecommunications network in response to step (d).

19. The method of claim 1, further comprising the steps of:

(e) estimating a pitch component of the speech signal;

(f) utilizing information about the pitch component in step (d) in response to step (e); and

(g) outputting a processed signal to a speech coder in response to step (f).

20. The method of claim 19, wherein the speech coder is selected from the group consisting of a code excited linear predication (CELP) coder, a vector sum excitation prediction (VSELP) coder, a waveform interpolation (WI) coder, a multiband excitation (MBE) coder, an improved multiband excitation (IMBE) coder, a mixed excitation linear prediction (MELP) coder, a linear prediction coding (LPC) coder, a pulse code modulation (PCM) coder, a differential pulse code modulation (DPCM) coder, and an adaptive differential pulse code modulation (ADPCM) coder.

21. The method of claim 1, further comprising the step of:

(e) outputting a processed speech signal to a speech coder in response to step (d).

22. A method for enhancing an intelligibility of a speech signal comprising the steps of:

(a) adaptive spectral enhancing the speech signal, wherein a distinctness of spectral peaks of the speech signal is increased;

(b) emphasizing higher frequencies of the speech signal, wherein an upward spread of masking of the speech signal is reduced;

(c) extracting a frame from the speech signal;

(d) calculating an energy contour and a spectral feature transition rate (SFTR) contour corresponding to the frame;

(e) performing syllable segmentation utilizing the energy contour and the SFTR contour in order to detect a time-scale modification syllable (TSMS);

(f) applying a scaling factor to a segment of speech, wherein the segment corresponds to a portion of the frame, comprising:

(i) setting the scaling factor to a first value if a consonant-vowel transition is detected within the TSMS;

(ii) setting the scaling factor to a second value if a steady-state vowel is detected with the TSMS; and

(iii) setting the scaling value to a third value for other portions of the speech signal;

(g) determining an overlapping segment that is best-matched to the segment according to a cross-correlation and waveform similarity criterion;

(h) calculating a time delay associated with the segment;

(i) adjusting the scaling factor associated with a subsequent segment according to the time delay determined in step (h);

(j) overlapping and adding the segment and the overlapping segment; and

(k) outputting a modified frame in response to processing all constituent segments of the frame.

23. A method for enhancing an intelligibility of a speech signal comprising the steps of:

(a) extracting a frame from the speech signal;

(b) calculating an energy contour and a spectral feature transition rate (SFTR) contour corresponding to the frame;

(c) performing syllable segmentation utilizing the energy contour and the SFTR contour in order to detect a time-scale modification syllable (TSMS);

(d) applying a scaling factor to a segment of speech, wherein the segment corresponds to a portion of the frame, comprising:

(i) setting the scaling factor to a first value if a consonant-vowel transition is detected within the TSMS;

(ii) setting the scaling factor to a second value if a steady-state vowel is detected with the TSMS; and

(iii) setting the scaling value to a third value for other portions of the speech signal;

(e) determining an overlapping segment that is best-matched to the segment according to a cross-correlation and waveform similarity criterion;

(f) calculating a time delay associated with the segment;

(g) adjusting the scaling factor associated with a subsequent segment according to the time delay determined in step (h);

(h) overlapping and adding the segment and the overlapping segment; and

(i) outputting a modified frame in response to processing all constituent segments of the frame.

24. A method for enhancing an intelligibility of a speech signal that is processed by a speech coder, comprising the steps of:

(a) extracting a frame from the speech signal;

(b) performing syllable segmentation in order to detect a time-scale modification syllable (TSMS);

(c) applying a scaling factor to a segment, wherein the frame comprises at least one segment, comprising:

(i) setting the scaling factor to a first value if a consonant-vowel transition within the TSMS is detected;

(ii) setting the scaling factor to a second value if a steady-state vowel within the TSMS is detected; and

(iii) setting the scaling factor to a third value for other portions of the frame;

(d) estimating the pitch component of the frame;

(e) determining an overlapping segment that is best-matched to the segment according to a cross correlation and waveform similarity criterion, and to the speech component if the frame has a voiced characteristic;

(f) combining the segment with an adjacent segment, comprising:

(i) overlapping and adding the segment and the overlapping segment if a correlation between the segment and the overlapping segment is greater than a threshold; and

(ii) essentially retaining the segment if the correlation between the segment and the overlapping segment is less than the threshold; and

(g) outputting a modified frame to the speech coder in response to processing all constituent segments of the frame.